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241A 3544

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	
MOTOHIRO TAKANO et al.	Group Art Unit: 1711
Serial No.: 10/748,164	Examiner: John M. Cooney
Filed: December 31, 2003	
For: SEALING MATERIAL FOR AIR-CONDITIONER	

RULE 132 DECLARATION

I, YOSHINOBU NISHIMURA, do hereby declare that:

1. I am a co-inventor of the above-described application serial No. 10/748,164;

2. I am a graduate of Toyama University, Graduate School of Engineering and received a Masters Degree in Materials Science in March 1996;

3. After graduating from college, I became an employee at Inoac Corporation in April of 1996 and have been employed by this company ever since;

4. During my employment at Inoac Corporation, I have been engaged in research and development relating to polyurethane foams and damper materials for air conditioners for automobiles;

5. The experiments resulting in the comparative example 3 and the tables 1-1 through 1-4 were all performed under my direction and control;

6. The experiments which were performed under direction and control is as follows:

Conditions

Comparative Example 3 was conducted with the composition and under the conditions for experimentation as described in the specification of the present application. Comparative Example 3 corresponds to an example wherein an amount of an antiozonant added exceeds the upper limit of the numerical range thereof. The antiozonat used in

Comparative Example 3 is Naugard 445 (tradename) manufactured by Crompton Corporation (number average molecular weight: 405; IUPAC nomenclature: 4,4'-(α,α-dimethylbenzyl)diphenylamine).

Further, as reference examples, the experiments wherein the antioxidants have the number average molecular weights of 1178 and 1468, respectively have been conducted. The experiment wherein the antioxidant has the number average molecular weight of 1178 corresponds to a working example in the present application.

The antioxidant C having a number average molecular weight of 1178 is IRGANOX1010 (tradename) manufactured by Ciba Specialty Chemicals (number-average molecular weight: 1178).

The antioxidant D having a number average molecular weight of 1468 is IRGAFOS 12 (tradename) manufactured by Ciba Specialty Chemicals (number-average molecular weight: 1463). The antioxidant D corresponds to "pentaerythritol tetrakis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate]" as described on the "Detailed Description of the Invention" section in the specification of the present application.

Results

The results are shown in the following Table 1.

Tables

Table 1

Table 1-1	Table 1-2
Table 1-3	Table 1-4

Table 1-1

Ingredient (pbw)		Example 1	Example 2	Example 3	Comparative Example 1
Polyether-ester copolymer polyol A					75
Ether polyol					30
Ester polyol					45
Polyether-ester copolymer polyol B		75	75	75	
Ether polyol		30	30	30	
Ester polyol		45	45	45	
Polyester polyol A		25			25
Polyester polyol B			25	25	
Isocyanate		55.1	55.1	55.1	55.1
Antioxidant A		-	-	-	0.01
Antioxidant B		0.01	0.01	0.01	-
Antioxidant C		-	-	-	-
Antioxidant D		-	-	-	-
Antiozonant A		5	5	-	5
Antiozonant B		-	-	5	-
Antiozonant C		-	-	-	-
Amine catalyst		0.3	0.3	0.3	0.3
Organic acid/metallic tin catalyst		0.3	0.3	0.3	0.3
Foam stabilizer		1.5	1.5	1.5	1.5
Blowing agent		3.9	3.9	3.9	3.9
VOC content (ppm)		2607	1660	275	3419
FOG content (ppm)		3343	3048	1366	3519
Ozone deterioration resistance	Air permeability before exposure	4.5	7.2	5.6	6.3
	Air permeability after 500-hour exposure	6.1	10.8	10.8	9.4
	Air permeability after 1000-hour exposure	13.5	16.4	16.4	15.8
Wet-heat aging resistance	Tensile strength before exposure (MPa/%)	162/100	152/100	146/100	153/100
	Tensile strength after 30-hour exposure (MPa/%)	158/98	152/100	146/100	153/102
	Tensile strength after 60-hour exposure (MPa/%)	149/92	141/93	139/95	142/93
	Tensile strength after 90-hour exposure (MPa/%)	134/83	126/83	126/86	128/84
	Tensile strength after 120-hour exposure (MPa/%)	109/67	99/65	99/68	100/65
	Tensile strength after 1500-hour exposure (MPa/%)	78/48	75/49	75/51	72/47
Processivity		O	O	O	O

Table 1-2

Ingredient (phw)		Comparative Example 3	Reference Example 1	Reference Example 2
Polyether-ester copolymer polyol A		-	-	-
Ether polyol				
Ester polyol				
Polyether-ester copolymer polyol B		75	75	75
Ether polyol		30	30	30
Ester polyol		45	45	45
Polyester polyol A		25	25	25
Polyester polyol B		-	-	-
Isocyanate		55.1	55.1	55.1
Antioxidant A		-	-	-
Antioxidant B		0.01	-	-
Antioxidant C		-	0.01	-
Antioxidant D		-	-	0.01
Antiozonant A		-	-	5
Antiozonant B		-	5	-
Antiozonant C		5	-	-
Amine catalyst		0.3	0.3	0.3
Organic acid/metallic tin catalyst		0.3	0.3	0.3
Foam stabilizer		1.5	1.5	1.5
Blowing agent		3.9	3.9	3.9
VOC content (ppm)		916	925	2721
FOG content (ppm)		1590	1617	3585
Ozone deterioration resistance	Air permeability before exposure	8	7.9	12
	Air permeability after 500-hour exposure	nd nd	11.2	nd nd
	Air permeability after 1000-hour exposure	nd nd	17.5	nd nd
Wet-heat aging resistance	Tensile strength before exposure (MPa/%)	150/100	150/100	70
	Tensile strength after 30-hour exposure (MPa/%)	149/99	148/99	nd nd
	Tensile strength after 60-hour exposure (MPa/%)	139/93	132/88	nd nd
	Tensile strength after 90-hour exposure (MPa/%)	115/77	125/83	nd nd
	Tensile strength after 120-hour exposure (MPa/%)	98/65	92/61	nd nd
	Tensile strength after 1500-hour exposure (MPa/%)	69/46	71/47	nd nd
Productivity		O	O	x

Table 1-3

Ingredient (VOC content/ POG content)	Example 1	Example 2	Example 3	Comparative Example 1
Polyether-ester copolymer polyol A	-	-	-	892/8
Polyether-ester copolymer polyol B	0/0	0/0	0/0	-
Polyester polyol A	704/242	-	-	602/260
Polyester polyol B	-	28/46	34/52	-
Antiozonant A	1702/3001	1463/2686	-	1660/2883
Antiozonant B	-	-	53/1058	-
Antiozonant C	-	-	-	-
Antioxidant A	-	-	-	4150/30
Antioxidant B	0/0	0/0	0/0	-
Antioxidant C	-	-	-	-
Antioxidant D	-	-	-	-
Isocyanate Amine catalyst Organic acid/metallic tin catalyst Foam stabilizer Blowing agent	201/268	169/316	188/256	185/368
Total	2607/3243	1660/3048	275/1366	7569/3549

Table 1-4

Ingredient (VOC content/ POG content)	Comparative Example 3	Reference Example 1	Reference Example 2
Polyether-ester copolymer polyol A	-	-	-
Polyether-ester copolymer polyol B	0/0	0/0	0/0
Polyester polyol A	675/200	690/235	750/286
Polyester polyol B	-	-	-
Antiozonant A	-	-	1760/2920
Antiozonant B	-	55/1110	-
Antiozonant C	50/980	-	-
Antioxidant A	-	-	-
Antioxidant B	0/0	-	-
Antioxidant C	-	0/0	-
Antioxidant D	-	-	0/0
Isocyanate Amine catalyst Organic acid/metallic tin catalyst Foam stabilizer Blowing agent	191/350	180/272	211/379
Total	916/1590	925/1617	2721/3585

Conclusion

The foam as described in Comparative Example 3 had average physical properties. However, the foam did not take a sufficient effect on ozone deterioration resistance and reduced its tensile strength after 500-hour exposure to such an extent that the air permeability could not be evaluated.

The experiment for showing the lower limit of the addition amount range of the antiozonant corresponds to Comparative Example 1. That is, in the Comparative Example 1 wherein the antioxidant A having the molecular weight of 220 was used, the VOC content and FOG content were higher and the foam could not achieve the satisfactory level.

The antioxidant used in the Reference Example 1 has the molecular weight of 1178. The VOC content was about 925 ppm and the foam good in both the ozone deterioration resistance and wet-heat aging resistance could be obtained.

The antioxidant used in the Reference Example 2 has the molecular weight of 1463. Because the molecular weight was higher, the VOC content and FOG content showed the comparatively low contents. However, with respect to the productivity of the foam, the foam caused the scorch and discoloration and reduced its tensile strength under wet-heat aging condition to such an extent that its tensile strength could not be measured.

7. From the above experimentation and the conclusions therefrom, it is clear that the sealing material for air conditioners with constituents that fall within the ranges of the present claimed invention and are used in the claimed manner, has a lesser VOC content and FOG content than those whose constituents fall outside of the ranges of the claimed invention of the present application.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: April 26, 2007

YOSHINOBU NISHIMURA